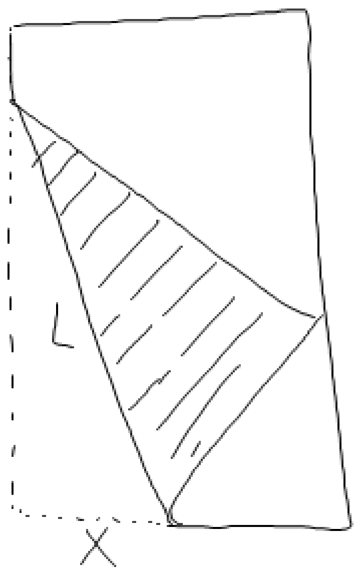
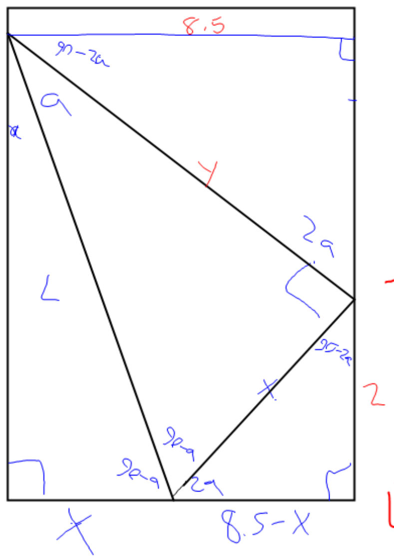
A rectanglar sheet of $8\frac{1}{2} \times 11$ in paper is folded so that one of the bottom corners is placed on the opposite longer edge, as shown. The problen is to make the folded edge as short as possible. (L)



(a) Show $L^2 = \dfrac{2x^3}{(2x-8.5)}$

(b) Minimize L^2



$$z^2 = x^2 - (8.5-x)^2$$

$$z = \sqrt{x^2-(8.5-x)^2}$$

8.5 is to z

y is to x

$$\frac{y}{x} = \frac{8.5}{\sqrt{x^2-(8.5-x)^2}}$$

$$y = \frac{8.5x}{\sqrt{x^2-(8.5-x)^2}}$$

$$L^2 = y^2 + x^2 = \left(\frac{8.5x}{\sqrt{x^2-(8.5-x)^2}}\right)^2 + x^2$$

$$L^2 = \frac{72.25x^2}{x^2-(8.5-x)^2} + x^2$$

$$L^2 = \frac{72.25x^2}{x^2-(x^2-17x+72.25)} + x^2$$

$$= \frac{72.25x^2}{17x-72.25} + x^2$$

$$= \frac{72.25x^2 + x^2(17x-72.25)}{17x-72.25}$$

$$= \frac{72.25x^2 + 17x^3 - 72.25x^2}{17x-72.25}$$

$$= \frac{17x^3}{17x-72.25} = \frac{2x^3}{2x-8.5}$$

4.4 #35, 37, 47, explorations 47, 49

→ write up <u>real nice</u>

<u>OR</u>

4.4 #21-23, 27, 31, 33, 36, 40, 41, 45